

# Dynamic Terminal Investment in Male Burying Beetles

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## Background

- Animals often increase their investment in reproduction in response to a threat to their survival, a life history strategy known as terminal investment.
- The dynamic terminal investment threshold model proposes that the tendency of an individual to terminally invest depends on other factors that alter an individual's residual reproductive value.
- We tested the dynamic terminal investment model in burying beetles (*Nicrophorus marginatus*), insects that bury small vertebrate carcasses as a source of food and that provide extensive biparental care.

We injected males at two different ages with heat-killed bacteria and measured their reproductive effort.

### Predictions

1. **Experiment 1:** Immune-challenged males would show a longer period of parental care, consume less of the carcass, and produce a greater number of larvae in the current reproductive attempt compared with control males.
2. **Experiment 2:** Older males would be more likely to terminally invest than younger males.



## Materials and Methods

### Experiment 1

- Adult beetles collected using baited pitfall traps.
- N = 20 experimental males and 20 control males.
- Males paired singly with females, provided with a carcass, and housed in peat-filled pails.
- $\Delta$  adult mass and duration of brood care recorded.
- Number and mass of young recorded.

### Experiment 2

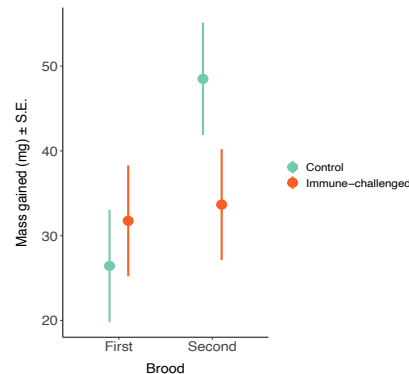
- Treatments reassigned to original males at an older age.
- Previous protocol replicated.

## Results – Part 1

**Experiment 1:** Males, when challenged with heat-killed bacteria as virgins prior to their first reproductive attempt, did not terminally invest.

### Experiment 2:

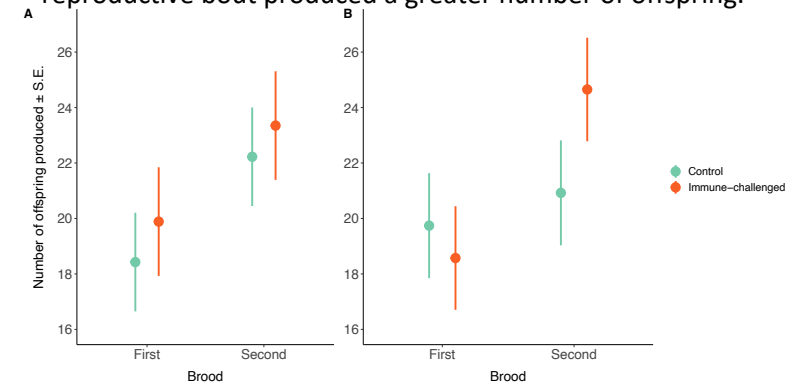
a. Older, immune-challenged individuals gained less mass during their time on the carcass than control males.



## Results - Part 2

### Experiment 2:

b. These same individuals when challenged in a second reproductive bout produced a greater number of offspring.



## Discussion

In conclusion, age-specific terminal investment in immune-challenged burying beetles was evidenced by a decrease in consumption of the resource critical to larval development (i.e. carrion) and an increase in the number of larvae produced.



## Acknowledgments

This research was funded by a grant from the National Science Foundation